Claims:

1. A single-stranded oligonucleotide DNA primer for amplification of a target DNA sequence capable of use in a multiplex polymerase chain reaction (PCR), said primer having the structure 5'-XY-3', wherein

a) X comprises a sequence that does not hybridize to said target sequence;

b) the melting temperature of a hybrid between X and its complement in the absence of other sequences is greater than about 60°C; and

c) Y comprises a sequence contained within or flanking said target sequence or its complement.

2. The primer of claim 1, wherein X comprises the sequence 5'-GCGGTCCCAAAAGGGTCAGT-3'.

3. The primer of claim 1, wherein X and Y each comprise from 17 to 20 bases.

4. The primer of claim 1, wherein the melting temperature of a hybrid formed between said primer and its complement in a solution of 0.5M NaCl is at least 72°C.

5. An oligonucleotide DNA primer for amplification of a target DNA sequence, wherein said primer consists of the sequence 5'-GCGGTCCCAAAAGGGTCAGT[Y]-

3', wherein Y comprises a sequence contained within or flanking said target sequence or its complement.

6. A method for simultaneous amplification of multiple DNA target sequences present in a DNA sample, which comprises:

a) contacting said DNA sample in a single reaction mixture with a multiplicity of paired oligonucleotide primers having the structure 5'-XY-3', wherein

(i) X comprises the sequence

5'-GCGGTCCCAAAAGGGTCAGT-3', and

(ii) Y comprises a sequence contained within or flanking said target sequence or its complement; and

b) performing multiple cycles of melting, reannealing, and DNA synthesis.

7. A method for detecting multiple defined target DNA sequences in a DNA sample, which comprises the steps of:

a) contacting said DNA sample in a single reaction mixture with a multiplicity of oligonucleotide pairs, each of said pairs consisting of a first and second oligonucleotide primer, wherein

(i) said first primer of each pair has the structure 5'-XY-3', wherein X comprises the sequence 5'-GCGGTCCCAAAAGGGTCAGT-3' and Y comprises a sequence contained within the target sequence or its complement, and

(ii) said second primer of each pair has the structure 5'-XY-3', wherein X comprises the sequence 5'-GCGGTCCCAAAAGGGTCAGT-3', and Y comprises a sequence flanking the target sequence or its complement;

b) performing multiple cycles of melting, re-annealing, and DNA synthesis to form amplification products of DNA samples primed with said oligonucleotides; and

c) detecting the amplification products.

8. The method of claim 7 wherein detection of an amplification product indicates the presence of the target sequence in the DNA sample.

9. The method of claim 7 wherein said detecting step comprises gel electrophoresis.

10. A method for high-throughput genetic screening to simultaneously detect the presence of multiple defined target DNA sequences in DNA samples obtained from a multiplicity of individuals, said method comprising the steps of:

a) providing a sample of DNA from each of said individuals;

b) simultaneously contacting each of said DNA samples obtained in a) with a multiplicity of oligonucleotide pairs, each of said pairs consisting of a first and second oligonucleotide primer, wherein

(i) said first primer of each pair has the structure 5'-XY-3', wherein X comprises the sequence 5'-GCGGTCCCAAAAGGGTCAGT-3' and Y comprises a sequence contained within the target sequence or its complement, and

(ii) said second primer of each pair has the structure 5'-XY-3', wherein X comprises the sequence 5'-GCGGTCCCAAAAGGGTCAGT-3', and Y comprises a sequence flanking the target sequence or its complement;

b) performing multiple cycles of melting, re-annealing, and DNA synthesis to form amplification products; and

c) detecting the amplification products.

11. The method of claim 10 wherein detection of an amplification product indicates the presence of the target sequence in the DNA sample.

12. The method of claim ~~9~~ 10 wherein said detecting step ~~comprise~~ comprises gel electrophoresis.